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The isoprostanes in biology and medicine.

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Isoprostanes are a new class of lipids, isomers of the conventional enzymatically derived prostaglandins, which are produced in vivo primarily by a free radical-catalyzed peroxidation of polyunsaturated fatty acids. F2-isoprostanes, isomers of the enzyme-derived prostaglandin F2alpha, are the most studied species, but analogous isomers of other prostaglandins and leukotrienes have been described. Because of their mechanism of formation, specific structural features that distinguish them from other free radical-generated products and chemical stability, they can provide a reliable index for the oxidant component of several diseases in vivo. Consistent data suggest that formation of F2-isoprostanes is altered in a variety of clinical settings putatively associated with oxidant stress. Moreover, measurement of F2-isoprostanes might provide a sensitive biochemical basis for dose-selection in studies of natural and synthetic antioxidants. Finally, some F2-isoprostanes possess potent biological activities in vitro and in vivo, suggesting that they may also act as mediators of the cellular effects of oxidative stress.

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